

INSPECTION REPORT: 00-295

August 9, 2000

This is to certify that undersigned surveyor on request of Ober, Kaler, Grimes and Shriver on behalf of the UK P&I Club, attended on board subject vessel in order to inspect accident site, where ship's crane #4 had failed, causing crane boom to drop onto shore-based discharge crane and causing death to 2 crew members; survey and reports as follows:

NAME OF VESSEL:	M/V "LEON I"
OWNERS:	Eternity Shipping Ltd. Malta
CARGO COMMODITY:	Raw Sugar in Bulk
PORT OF DISCHARGE:	Baltimore, Md., USA
PLACE OF DISCHARGE:	Domino Sugar Pier, Baltimore, Md., USA
DATE OF ARRIVAL/DISCHARGE:	July 24, 2000
PLACE OF SURVEY:	On board the vessel during discharge at Baltimore
DATES OF SURVEY:	July 29, 31 Aug. 3 and 4. 2000
REASON FOR SURVEY:	Failing of topping wires on Crane #4, causing boom to fall, damaging shore based discharge crane and death to two (2) crew members.

Present During Time of Survey:

Capt. Heiner Popp:

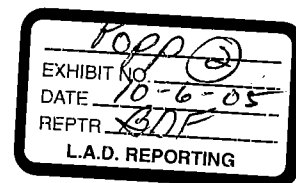
Surveyor for Capt. Heiner Popp, Inc. on behalf of Ober, Kaler, Grimes & Shriver (Owners P&I club)

Vessel's Particulars:

Flag: Malta
 Gross: 19,872 RGT NET: 14,401 RGT
 LOA: 198.40m LPP: 185m Breadth: 24m
 Built: Poland at Szczecin Yard, 1982
 Class: ABS
 Operator: Eurocarriers S.A. Athens, Greece

Subject vessel is a bulk cargo carrier with 7 holds, aft accommodation and fitted with 4 deck cranes.

Hatch covers are steel folding pontoons - hydraulically operated.



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August 14, 2000

MV "LEONI"

SURVEYOR'S NOTES:

It was reported that vessel had been in process of discharge July 29, 2000. At appr. 09:00 hours boom of ship's crane #4 dropped down. As alleged, basket had been hanging on hook of boom close to aft coaming #6A, with 2 crew members cleaning coaming of hatch 6A aft of residue sugar. During drop down of boom, basket was dragged over stowed hatch covers located between hatch opening #6 and #6A. Crew members were spilled/ catapulted from basket. Shore crane boom, which was located over hatch #6, than was hit by falling ship's boom, causing collapse of shore crane boom and back stay/bracing and drop down into hold by same.

Draft: July 28, 2000 18:00 hours: F:6.20m A: 6.00m

FINDINGS:

Undersigned boarded vessel July 29, 200 at 11:00 hours. Police and Coast Guard investigation was ongoing at this time with medics, police officers and CG personal on board.

Weather: Cloudy, light wind, 92 degrees Fahrenheit.

CARGO: Quantity of sugar remaining in lower hold #6 forward was cubed out. A total of 278cbm of sugar were found within hold. Based on 35.31cb/foot per cbm and 55# a cubic foot, a total weight of 539,890# remained on board after completion of discharge.

GENERAL OBSERVATIONS:

- a. Hatches #6 and 6A were found open with pontoons stowed in their respective stow locations.
- b. Discharge gear, i.e. 2 dozers were found parked in bottom of hold #6, stowed under center beam.
- c. Shore crane boom was found hanging from shore crane down into hatch way #6 with some of cat walk rails having dropped down into hold #6.
- d. Ship's crane #4 was found with boom pointing forward and resting on covers between hatches 6 and 6A. Boom top was directly over port coaming #6 hatch port side.
- e. Boom block was found hanging within it's runner, located within catwalk area.
- f. Basket base was lying on deck adjacent and leaning against catwalk with wire bridle still connected to block shackle, 3 of the corner stanchions had broken off but were still attached to bridle.
- g. Lumber board chips and planks from within basket were found scattered port side on deck, between stowed hatch covers on deck and within hold #6 in tank top area and on top of sugar cargo. One hard hat was noted lying on deck port aft adjacent to hatch coaming #6. One shoe was found middle of port deck between hatch coaming and bulwark. One shoe and one hard hat were found lying on sugar within hold #6. Drip down stained area was noted on sugar surface under coaming area port side forward hold #6 (2' x 6', area where crew member came to rest, hanging adjacent and inside of coaming).
- h. Coaming hatch 6A aft and port side aft from within hatch was found clean and free of sugar residue. Sugar residue was found clinging to inside of coaming starboard and middle aft of coaming area. End of cleaned area indicates to what point crew had advanced when cleaning coaming.

GENERAL OBSERVATION: cont.

CRANES:

Manufacturer: ISHIKAWAJIMA HARIMA (IHI) HEAVY INDUSTRIES CO, LTD.
Type: Electric ,
Crane Capacity: 20.0MT SWL capacity and 22m max out reach.

Cranes as alleged were installed on board vessel "LEON I" during shipyard time in China December 1999. As stated by master, cranes had been built in 1972. Cranes had served on vessel "Futupo", which was scrapped October 1999 sailing at that the time under the name "Janice K".

Crane #4.

Location: aft of hatch 6A in centerline. Crane is mounted on pedestal, with base platform above height of vertically stowed hatch pontoons. Crane is said to have a 22m max reach and 20mt SWL capacity.

Last Quintennial Inspection Date: 20. 12. 1999
Last Annual Inspection Date: 20. 12. 1999
Inspection Company: ABS

Crane Cabin: Electric switch board in back of crane open with covers resting at left against side paneling of crane cab.

At left side of crane operator seat there is a handle pedestal for topping and sluing of crane. Handle was found in a slight lowering position(Forward by appr. 3 degrees) .

At mid-height of lever pedestal there is a chrome button which controls the override for the limit switch . Key hole on button was in 45 degree angle to right- which indicates unlocked position.

Right side of crane operator seat there is a handle pedestal for lowering and raising of lifting block runner. Lever was found in full open position with lever moved to 90 degrees aft. (Raising of runner)

Levers were found not spring loaded (centering back to neutral when not held in place) and button for controlling override switch of sluing lever was found getting stuck/ not responding after having been engaged / pushed.

TOPPING WIRE DRUM/MOTOR

Marks: NTKKC Form: VCKLS
Power: 37/18.5 KW 4/3 pole
440Volt/60Hz
RPM 1750/875
Weight 525 kg

Located at top of drum assembly, was found with groove pattern to achieve even lay of wire when drum is winding up. Last two (2) lays of wire on drum were noted to rest on even drum surface, i.e. grooving on drum was by passed.

CRANE WIRES:

Wires for crane were inspected within drum area and at top of crane.

Crane boom topping wire: 26mm diameter, 6 strands, 37 wires per strand plus 1 fiber core. Wire was found parted with loose, frayed ends jammed in areas of sheaves at top of crane. Parts of fiber core were found lying at top of crane cabin and within sheave areas of crane top sheave assembly.

Wire appears to have been parted in one area only, with ends of wire showing bright and shiny metallic surface. Individual wires within strands were found curled/ frayed out. Broken wire end leading to hook was found jammed in sheave area, opposite end of tear was found lying in drum area of crane at right side at back. (Height from drum to top of crane sheave assembly: 6m)

One additional area of partial parting, i.e. meat hooks around circumferences of wire was found. Grease was noted disturbed in this area with paint discoloration apparent, indicating possible contact with sharp surface. (App. 7m from boom swage fitting.)

Overall wire was well greased and no other deficiencies were noted during initial inspection on board vessel with wire on drum. Follow up survey at premises of Chesapeake Engineering Comp., where wire is kept for further analysis, showed 2 additional areas of decay with meat hooks in area of drum (6 to 10 wires per lay on one strand), number of broken wires exceeded permissible number. Area of wire close to boom head was found with rusty surfaces. Fiber rope core was resilient, pliable and no signs of decay found.

Crane runner wire: 35mm diameter, 6 strands, 37 wires per strand plus 1 fiber core.

Wire was found in good order and well greased. No meat hooks were noted.

CRANE BOOM:

Heavy indentation on right side boom girder from underneath in area of 6.3m distance from extreme boom top. Round sharp impact area in centerline(blue color discoloration) of girder indicated where ship's boom contacted with shore crane. Left girder of boom showed creasing in equal distance from boom head, no impact marks were noted, indicating that this boom girder buckled by force of impact on opposite side. Boom within itself is distorted/ bent..

Interconnecting bracing between boom girders showed grease staining and gouging at center, indicating where wires had cut into steel when boom was in free fall.

TOP OF CRANE/ SHEAVE ASSEMBLY

Within sheave areas at top of crane paint residue and fiber core remnants were noted. Sheaves appear to be in good order and alignment.

A total of 6 sheaves are located at top, 2 (2nd and 3rd from left) for boom topping wire and 4 (1st, 4th, 5th and 6th) for runner.

2nd sheave was found empty with rope fiber debris within groove.

MACHINERY COMPARTMENT (underneath crane cab)

Cable drums were found located in compartment. At right side of cable drums the mechanism for crane winches by-pass was located. Two (2) by passes were located in one box. Box was open, no cover was found over mechanism.

- a. Limit switch traveler for boom topping wire was found at maximum raised position – traveler was actually slightly past disconnect contact.
- b. Limit switch traveler for runner was in midsection.

Topping wire was found slack and hanging down within compartment, severed end was at right in back of drum, last windings were loose.

Crane was tested and cable drums were found in working order with limit switch for topping wire appearing to engage.

MEASUREMENTS:**CRANE TURNING RADIUS:**

Crane blue prints were made available. Boom in max. topped position has a turning radius of 4.59m, at which time boom is resting against stoppers.

Measurements were taken from center of crane pedestal #4 forward. It was found that with boom raised to maximum height- with crane pointing forward- distance of runner block to inside of coaming is to be 2.27m.

Crane limit by-pass switch was tested. Crane boom winch did appear not to activate at time of lifting of boom.

Boom stoppers were found located either side of crane top, provided with rubber pads. Imprints of rubber pads were found in area of boom heel indicating that boom had been heaved against stoppers. Cranes 1 through 3 were inspected for comparison purposes and found without stopper imprints on booms.

BASKET:

Dimensions: 1.50m x 1.20m x 0.60. Basket was of steel angle construction (0.05m x 0.07m angles of 1/4" gauge), lumber board flooring and sides. Corner angle bars were provided with one (1)- 1/4" wire per corner post, which in turn was found, spliced to continuous link appr. 6' above basket.

LOCATION OF SHOES:

- a. 1st shoe located 3.2m off coaming port side and 1.90m forward of end of hatch coaming #6.
- b. 2nd shoe located in way of 6 corrugation 6 to 7 frame on top of sugar cargo within hold #6.

MEASUREMENTS: cont.

LOCATION OF HARD HATS:

- a. 1st on deck adjacent to hatch coaming port side and 1.10m forward of aft corner of #6 hatch.
- b. 2nd hard hat aft of sugar cargo lying on tank top port side.

WET STAIN:

Port side forward in way of coaming, on top of sugar cargo surface, there was a 2' x 6' drip down pattern of liquid in way of frames 6, 7 and 8, 3.20m from shell plating. Samples were taken. (Area of wetting was directly under area where crewmember had come to rest after crane collapse, wetting appeared to be blood.)

DISCHARGE OPERATION:

ROB sugar quantity hold #6 was refused by Domino Sugar for discharge due to surface contamination by lead paint abrasions and alleged human body fluid contamination.

August 8, 2000

17:15 completed discharge at Domino Sugar

21:15 hours vessel shifting to anchorage Baltimore

After completion of discharge at Domino vessel shifted to different berth in Baltimore proper, with vessel docking August 4, 2000 09:15 at Old Ore Pier, Sparrows Point.

Stevedores: Chesapeake Bulk Stevedoring

Disposal : Environmental Services Group, Inc.

12:00 hours vessel started discharge with shore crane

13:50 hours vessel discharge completed.

A total of 5 D-trailer, 5 tri-axle and 2 regular dump trucks were loaded with sugar to be dumped.

22:20 hours vessel sailed.

SURVEY AND REPORT MADE WITHOUT PREJUDICE AND SUBJECT TO TERMS AND CONDITIONS OF CONTRACTS/AGREEMENTS

REQUESTED BY: Mr. M Hamilton Whitman, Jr.
Ober, Kaler, Grimes & Shriver
120 East Baltimore Street
Baltimore, Maryland 21202

**CAPT HEINER POPP, INC.
MARINE SURVEYORS**

BY: _____
Capt. Heiner Popp

HP:bp
Encl.

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August 14, 2000

M/V "LEON I"

DATES/TIMES:

July 29, 2000

Undersigned attended on board at 11:00 hours. Police and CG investigators were at accident scene and investigation was on going. Discharge operation had seized for the day.

17:00 hours Domino Sugar employees started to assess removal procedures for shore crane boom from hold #6.

July 31, 2000

Undersigned on board 09:00 hours. Shore crane was found removed from hold with individual broken pieces stored on shore side of Domino facility.

Coast Guard inspectors were continuing inspection on board.

August 3, 2000

Undersigned attended on board 08:00 hours to cube out sugar quantity left hold #6 forward. C.G. investigator still in attendance of vessel for investigation of accident.

Discharge of remaining sugar within hold #6 after accident was refused by Amstar due to possible human waste contamination and lead paint scraping- which were caused during collapse of shore crane.

Present during survey:

Cpt. Gerald Ross	Dennis M. Leahy & Co., Inc. on behalf of Domino Sugar
Mr. William Neubrand	Surveyor Maritime Alliance Group Inc. on behalf of Charterers Luis Dreyfus
Mr. Andrew Much	Surveyor McLarens Toplis behalf of Maloney
Cpt. Heiner Popp	Surveyor on behalf of owner's P & I
Mr. John Luard	Surveyor on behalf of Underwriters for Luis Dreyfus Contacted our office August 9, 2000 in order to due possible follow up survey.

Basket stanchions, wire bridles, safety belts were taken in possession by undersigned.

Discharge of remaining sugar was arranged at other than Amstar berth for August 4, 2000.

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M/V "LEON I"

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August 14, 2000

August 4, 2000

Vessel docked at Sparrows Point at the old ore pier at west berth.

12:00 hours discharge of sugar commences. Sugar was discharged to holding area in back of apron of pier and loaded out to trucks by means of front end loaders.

14:00 hours discharge of sugar is completed. Repairs are ongoing on board vessel to repair edge damages to hatch covers hold #6 and 6A to facilitate proper closing of hold #6/ 6A.

August 9, 2000

08:00 hours attended during close up inspection of wire at Chesapeake Engineering.

PHOTO CAPTIONS:

1. View of port side with crane #4 – boom forward.
2. Topping wire at top of crane sheave assembly with torn wire and opened strands.
3. Scuff marks on topping wire and rope wire core lying on crane cab roof.
4. Boom head assembly with block remnants of basket (base ropes that were used to hold basket still).
5. Basket side stanchions with lifting wire.
6. Block was provided with main shackle. Solid link of basket bridle was secured by shackle to block shackle

7. Lashing rope that was secured to block shackle
8. Hatch cover pontoon 6A that showed drag
9. Luffing handle was forward – arrow slightly back
10. Runner handle fully engaged to back
- 11&12 Electrical switch panel with covers removed
13. DS switch to normal – on
14. View from top of crane towards top of boom – Hold 6
- 15,16,17 Broken topping wire with frayed out ends. Bright tears on end of wire fraying. (Rope core section lying at top of crane cab)
18. Sheave assembly with frayed residue on 2nd from left
19. Sheave assembly with broken wires.
20. Frayed out topping wire.
- 21, 22, 23 Shore crane with lattice type back stay support and boom hanging into Hold #6
- 24, 25 Hatch coaming #6A port aft – with sugar scraped off up to midsection
- 26, 27, 28 Hold #6 aft under hatch cover 6A with 2 dozers parked in back, sugar remaining forward and bucket lying on sugar. Wood debris at left is from basket floor from where crew was working
29. Buckled/ indented crane boom at right side – caused by impact of ships' boom and shore crane head section
30. Shore crane head section
- 31, 32 Wood debris from basket that was spilled out when basket was flipped and dragged over open covers #6 aft and 6A forward.

PHOTOGRAPH CAPTIONS cont.

33. Top of block with impact mark.
 34. Block with view from front.
 - 35, 36, 37 1 basket wire was secured to block shackle by fiber rope.
 - 38, 39 Hold #6 aft – port, debris adjacent to coaming. Floor boards from basket and hard hat.
 - 40, 41, 42 Crane drums override switches
 43. Topping wire drum with loose wind.
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- 44, 45 Sluing gear with override lock. Key insert indicates that it is unlocked.
 46. Chalk mark on coaming hatch #6 port side indicates how far off block was from coaming when fully topped.
 47. Overall view of accident site with boom #4 resting on hatch covers. In foreground shore crane with collapsed boom.
 48. Accident site from aft forward standing adjacent to starboard hold #7.
 49. View of crane boom from within crane cab with boom resting forward on lids 6aft and 6A forward.
 50. Shore crane after boom had been removed from hatch.
 51. Overall view of crane boom #4 from forward to aft.
 52. Close up of ship's crane resting on hatch covers. (In fore ground impact area where boom impacted with shore crane boom.
 53. Main switch panel for crane operation within crane cabin of crane #4.
 54. Runner lever at right of crane cabin seat with cover removed..
 55. Sugar hold #6 with hand rail at top surface starboard side.
 56. Sugar hold #6 port side with hard hat from crewmember in foreground..
 57. Hard hat from crewmember.
 58. Stain on top surface of sugar in port area under coaming.
 59. Overall view of port side.
 60. Overall view on starboard side.
 61. Boom stopper imprint on boom left side.
 62. Boom with imprint of stopper on right side.

PHOTO CAPTIONS: cont.

63. The 2 block boxes at left top control the circuit breakers for limit switches as per electrician.
64. Base of basket.
65. Discharge commences at 12:00 hours August 4, 2000.
66. Sugar was dumped to pier and loaded out by front end loaders.
67. Damaged wire had to be cut off within crane machinery compartment prior full length of wire, that was still on drum, could be removed.
68. Opened up wire strands and feathered out wires.
69. Rope core was found soft and resilient.
70. Opened up strands and feathered out wires.
71. Crane topping wire as found stored in truck.
72. Wire was found well greased, uneven lay at end where wire parted where wire had partially unraveled and core partially collapsed.(Up tp 13' from end)
73. Same as pict. 72.
74. End of wire with torn section.
75. And 75A Section within wire with rust and meat hooks. (Close to boom fitting.)
76. Wire with nest of broken wires appr. 9m from broken end. (6 to 8 wires parted)
77. Broken wires located appr. 9m from drum clamp. (appr. 8 to 10 wires)
78. Gouged wire area from close to boom top fitting. (Appr. 6 to 7m from end.) Gouge was fresh and grease surfaces were disturbed.
79. Pallet with wire from top of boom with fitting.
80. Pallet at top is wire with broken end from within crane compartment.